

# Contents

*Introduction* *xxiii*

*Assessment Test* *xxxv*

<b>Chapter 1</b>	<b>Designing a Complex Windows Server 2008 Infrastructure</b>	<b>1</b>
	Overview of Design Models	2
	The Centralized Model	3
	The Decentralized Model	4
	The Hybrid Administration Model	5
	Designing a Forest Structure	5
	Forest Functional Levels	6
	Forest Design Elements	7
	Autonomy vs. Isolation	8
	Forest Models	8
	Forest Schema	11
	Designing an Active Directory Domain Structure	13
	Domain Functional Levels	13
	Single and Multiple Domains	14
	Regional Domain Model	16
	Creating Your Domain Structure	17
	Active Directory Authentication	17
	Overview of Forest and Domain Trust Models	18
	Forest Trusts	18
	Domain Trusts	19
	Overview of Physical Requirements and Physical Topology	21
	Restrictions	21
	Placing Domain Controllers	23
	The Global Catalog	25
	Operations Master Location	25
	Overview of Site and Replication Topology	27
	Site Links	27
	Site-Link Bridges	29
	Choosing Server Roles	30
	Security Design Features	30
	Administration and Delegation Features	32
	Summary	36
	Exam Essentials	37
	Review Questions	38
	Answers to Review Questions	45

<b>Chapter 2</b>	<b>Planning Naming Conventions, Networking, and Access Principles</b>	<b>47</b>
	Network Addressing	48
	Addressing Techniques	48
	Address Ranges	49
	Addressing and Subnetting IPv4	51
	Addressing IPv6	61
	IPv4 to IPv6 Transitional Techniques	66
	Legacy Networking and Windows Server 2008	71
	Naming Conventions for Windows Server 2008	74
	Internal and External Namespaces	74
	Zone Types and Zone Transfers	76
	Active Directory Replication with DNS	77
	DNS Server Requirements and Placement	78
	Planning for Network Access	79
	Password-Based Policy Authentication Protocols	79
	Certificate-Based Authentication	80
	Network Access Policies and the Network Policy Server	81
	Perimeter Networks	83
	Server Placement	85
	Summary	86
	Exam Essentials	87
	Review Questions	88
	Answers to Review Questions	92
<b>Chapter 3</b>	<b>Planning for Forestwide and Domainwide Upgrades with Server 2008</b>	<b>95</b>
	The Essence of Migration	96
	Using the Active Directory Migration Tool	97
	Using Caution with Migration	97
	Migrating Objects	98
	Consolidating Objects	98
	Options with the Active Directory Migration Tool (ADMT)	100
	Migrating User Accounts	102
	Migrating Computer Accounts	106
	Cross-forest Authentication	110
	Types of Trusts	110
	Planning for Upgrades in an Existing Forest	118
	Forest and Domain Preparation	119
	Preparing for a Read-Only Domain Controller	119
	Preparing for a Server Core Installation	121
	Planning for Reduction	123
	Adding Windows Server 2008 into a Live Environment	124

	Summary	125
	Exam Essentials	126
	Review Questions	127
	Answers to Review Questions	132
<b>Chapter 4</b>	<b>Planning for Terminal Services and Application Virtualization</b>	<b>135</b>
	Reviewing Terminal Services' Roles	136
	Terminal Services Server Load	136
	Terminal Services Licensing	137
	Licensing Types	138
	Licensing Scope	138
	Licensing Process for Terminal Services	139
	Licensing Server Placement	139
	Terminal Services License Monitoring	140
	Terminal Services Licensing Services Events	140
	Terminal Services Gateway	141
	Terminal Services Gateway Protocols and Requirements	142
	Terminal Services Gateway Placement	143
	Terminal Services Gateway Security	143
	Terminal Services Gateway Events	144
	Terminal Services Session Broker	144
	Terminal Services Session Broker Requirements	145
	Terminal Services Session Broker Load-Balancing Process	145
	Terminal Services Session Broker Events	145
	Terminal Services Web Access	146
	Terminal Services Web Access Prerequisites	146
	Terminal Services Web Access Setup	146
	Terminal Services Group Policy Options and Changes	147
	Terminal Services Easy Print	147
	TS Gateway Policy	148
	Controlling Client Behavior for RemoteApp Programs	149
	Terminal Services Maintenance and Error Recovery	149
	Terminal Services' Terminal Server Drain Mode Feature	150
	Common Event Codes	151
	Application Virtualization	151
	Application Virtualization Basics	152
	Application Virtualization Components and Software	154
	Microsoft SoftGrid	155
	Scaling an Enterprise with Application Virtualization	156
	How Many Users Will Need to Be Supported?	156
	What Operating System Do the Applications Require?	157
	Are There Any Shared DLLs, INIs, or Other Resource-Required Files?	157

	SoftGrid Infrastructure Planning and Design	157
	Summary	160
	Exam Essentials	160
	Review Questions	161
	Answers to Review Questions	165
<b>Chapter 5</b>	<b>Designing an Effective Administration Model</b>	<b>167</b>
	Object Essentials	169
	Object Security Descriptors	169
	Access Control Entities	170
	Organizational Units	170
	OU Design Requirements	174
	Autonomy	174
	Group Policy	174
	Visibility	174
	Groups in Active Directory	176
	Group Scope	176
	Domain Local	177
	Global	177
	Universal	177
	Built-in Local Groups	177
	Altering Group Scope	178
	Planning for Groups	180
	Planning Domain Local and Global Accounts	180
	Planning Universal Groups	181
	Planning Delegation	182
	Object-Based Delegation	182
	Task-Based Delegation	183
	Delegation Options	183
	Inheritance	185
	Using the Security Configuration Wizard for Compliance Auditing	187
	Summary	189
	Exam Essentials	189
	Review Questions	190
	Answers to Review Questions	198
<b>Chapter 6</b>	<b>Planning and Designing Group Policy</b>	<b>201</b>
	Understanding Group Policy Scope	202
	Applying Group Policy	203
	Inheritance	204
	No Override Inheritance and Block Policy Inheritance	205

Understanding Loopback Processing	206
Understanding Group Policy Security Filtering	206
Windows Management Instrumentation Filters	209
Planning Group Policy	210
Step 1: Create a Reasonable OU Structure	210
Step 2: Define Restrictions and Objectives	210
Step 3: Design Group Policy for Your Infrastructure	211
Working with the Default Domain Policy and Domain Controllers	
Policy	211
Delegating Group Policy Administration	212
Exploring New Windows Server 2008 Group Policy Features	214
Administrative Template Files	215
Starter GPOs	215
Comments for GPOs	218
Network Location Awareness	219
Preferences	219
Configuring Automatic Updates with Group Policy	224
Restricting Group Membership with Group Policy	225
Controlling User Installation of Devices	228
Searching GPOs	229
Using the Group Policy Modeling Tool	231
Summary	233
Exam Essentials	234
Review Questions	235
Answers to Review Questions	241
<b>Chapter 7</b>	
<b>Administering Security in an Enterprise-Level Infrastructure</b>	<b>243</b>
Enterprise Security Concerns	244
Security Policy	244
Certification Policy	245
Certification Practice Statement	245
Using Windows Server 2008 PKI Additions in a Legacy Environment	245
Designing a Certificate Authority Hierarchy	245
Choosing a Tier Model	246
Modeling Your Structure	248
Following the Administrative Structure	248
Following an Independent Structure	249
Design Factors	249
X.509	249
Using Certificate-Monitoring Tools	250
Reasons for a PKI	251

Components of the Public Key Infrastructure	251
Certificate Authority	252
Certificate Revocation Lists	252
Certificate Templates	252
Certificate Authority Roles	252
Root CA Role	252
Intermediate CA Role	253
Policy CA Role	253
Issuing CAs	253
Enterprise and Stand-Alone CAs	253
Using the Online Certificate Status Protocol	254
Online Responders	254
OCSP Components	255
OCSP Client	255
Online Responder	255
Revocation Providers	255
Working with Certificate Templates	261
Using Cryptography Next Generation	262
Managing External Clients	262
Enrollment Strategies	262
Types of Enrollment	263
Web Enrollment	263
Command-Line Enrollment	263
Certificates MMC	263
Autoenrollment	264
Enrollment Agents and Restricted Enrollment Agents	264
The Network Device Enrollment Service	264
Virtual Private Networks and Security	265
Summary	266
Exam Essentials	266
Review Questions	267
Answers to Review Questions	271
<b>Chapter 8</b>	<b>Planning for Business Continuity and Backup</b>
	<b>273</b>
Introducing RAID	274
Software RAID	274
Hardware RAIDs	275
RAID Configurations	275
Introducing the Distributed File System	279
DFS Components	279
DFS Replication	280
DFS Features	280

Introducing Failover Clustering	281
Clustering Components	282
Clustering with Windows Server 2008	282
Introducing Quorums	283
Witness Disks and File Share Witness	283
Introducing Network Load Balancing	283
Using Windows Server Backup Tools	285
Windows Server Backup	285
Wbadmin	285
Introducing the Encrypting File System	286
Introducing Windows BitLocker	287
Recovering Active Directory Domains Services	287
Recovering Active Directory Domain Controllers	287
Storing Operating System Files Separately	288
Restoring AD DS	288
Introducing Windows Recovery Environment	288
Windows Complete PC Restore	289
Windows Memory Diagnostic Tool	289
Command Prompt	289
Using Windows Recovery	289
Using Volume Shadow Copy	289
Using Server Core	296
Introducing Active Directory Rights	
Management Services and File Protection	297
Summary	297
Exam Essentials	298
Review Questions	299
Answers to Review Questions	304

<b>Chapter 9</b>	<b>Designing a Windows Update Strategy for the Enterprise</b>	<b>307</b>
	Establishing a Security Baseline	308
	Enterprise Client Environments	309
	Specialized Client Environments	309
	The Microsoft Baseline Security Analyzer Tool	310
	System and Environment Health Models	311
	Server Availability	311
	Server Uptime	312
	Server Downtime	313
	Service Availability	313
	Hardware Statistics	313

Planning and Implementing Windows	
Software Update Services (WSUS)	313
WSUS Server Deployment	315
Anatomy of WSUS	315
WSUS Update Hierarchy and Administration Decisions	316
WSUS Grouping	325
WSUS Options	326
WSUS Reports	326
Overview of System Center Essentials 2007	327
Overview of System Center Configuration Manager 2007	328
Overview of Windows Update	329
Overview of Microsoft Update	333
Real-World Update Practices	334
Research Updates Before Downloading Them	334
Update Based on a Schedule	334
Inform Users of Major Updates	334
Apply Updates at Low-Usage Times	334
Simulate Updates Before Deploying Updates	335
Be Prepared for Rollback in Case of Failure	335
Update Compliance	335
Summary	336
Exam Essentials	337
Review Questions	338
Answers to Review Questions	343
<b>Chapter 10</b>	
<b>Using Virtualization to Increase Productivity and Facilitate Consolidation</b>	<b>345</b>
Introducing Virtualization	346
The Different Types of Virtualization	348
Presentation Virtualization	348
Application Virtualization	348
Desktop Virtualization	348
Server Virtualization	349
Virtualization vs. Multitasking	349
Introducing Server Consolidation	350
Hyper-V	351
Understanding Virtualized Machine Components	354
Using the Virtualization Management Console	355
Snapshots	355
Failover and Recovery with Hyper-V	356
Network Setups with All Types of Virtual Machines	356
Host NAT	356
Bridged Connection	357
Host Only	357

Virtual Networks	357
Internal Virtual Networks	357
External Virtual Networks	358
Private Virtual Networks	358
Multiple Network Interface Cards with Virtual Networks	358
Installing Hyper-V	359
Introducing iSCSI	368
Logical Unit Numbers	369
Windows Vista x64 Hyper-V Management	369
Server Core and Virtualization	370
Using System Center Virtual Machine Manager 2007	370
SCVMM Server	371
SCVMM Agent	371
SCVMM Database	372
SCVMM Library Server	372
Using Virtual Server 2005 R2	372
Summary	373
Exam Essentials	373
Review Questions	374
Answers to Review Questions	379
<b>Glossary</b>	<b>381</b>
<b>Appendix A</b>	<b>About the Companion CD</b>
	<b>393</b>
<i>Index</i>	397